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ABSTRACT

This study examined the extent to which an After-School Peer Tutoring (ASPT) program in a rural southeastern school district was effective in elevating achievement levels of 89 at-risk middle school students enrolled in the program for one semester. End-of-semester grade was used as a measure of performance. The study also analyzed indicators of at-risk behavior, as evidenced by students' suspension history and placement in special education. Findings indicated that the program was effective in increasing academic performance among the majority of attendees, many of whom attained passing scores in language arts, science, mathematics, and social studies. The ASPT program was least successful for mathematics. A history of suspension was a deterrent for improved achievement. Caucasian Americans appeared to benefit more from the tutorial services than other groups. Sixth grade students benefitted the most followed by 7th graders with 8th grade students benefitting the least. (Contains 16 references.) (Author/DB)

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Effect of an After-School Tutorial Program on Academic Performance of Middle School Students At-Risk

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Abstract

The purpose of this study was to assess the extent to which an After-School Peer Tutoring (ASPT) program was effective in elevating achievement levels of middle school students' at-risk. The sample comprised 89 at-risk middle school students enrolled in the ASPT program for one semester. End-of-semester grade was used as a measure of performance. Also analyzed were indicators of at-risk behavior, as evidenced by students' suspension history and placement in special education. Findings indicated that the program was effective in increasing academic performance among the majority of attendees, many of whom attained passing scores in language arts, science, mathematics, and social studies. However, the ASPT program was least successful for mathematics. Differences due to ethnicity, grade level, and suspension history also emerged.

Effect of an After-School Tutorial Program on Academic Performance of Middle School Students At-Risk

Observations of middle school students' performance indicate a drop in grade point average and a concomitant decline in student motivation occurring during the middle school years (Anderman & Maehr, 1994)--factors that place this population at-risk for dropping out of school. Indeed, Oaks, Worthy, and Remaley (1993) found that 25% of students attending middle and high schools in the United States did not complete their high school education. Further, estimated national dropout rates reflect a range between 15% and 30% of the school-age population (Richardson & Griffin, 1994). The factors that compromise students' process of learning and influence their decision to drop out of school are counter-productive learning behaviors and low academic achievement accompanied by problems with self-esteem (Brodinsky, 1989). Often, students exhibiting these characteristics are chronologically older than are typical students because of past grade retention (Parkay & Stanford,1998).

Students' decision to drop out has economic ramifications that include an unemployment rate that is four times greater than that of high school graduates, and overall, a diminished life-time earning capacity that represents, on the average, $200,000 less money earned than employees with a high school diploma (Edmondson & White, 1998). Also, there are social consequences as indicated by the high percentage of the prison population, with three out of four prisoners not possessing a high school diploma upon entering prison (Edmondson & White, 1998). To address these phenomena,

some school districts have implemented after-school tutorial services that are designed to elevate academic performance and to deter students from developing at-risk behaviors that are associated with poor performance (Parkay & Stanford, 1998). The impetus for revamping the school day, in order to provide supportive experiences after the traditional school day ends, has received state funding as well as monetary support from the U.S. Department of Education's 21st Century Community Learning Centers programs (National Governors' Association, 1999). Although, after-school tutorial programs are receiving support from policy makers as a method to redress low achievement and to reduce the occurrence of at-risk behaviors, there is limited empirical evidence evaluating the efficacy of such programs in meeting these goals (Bender & Stahler, 1996; Fashola, 1998).

However, the limited empirical evidence evaluating after-school tutorials supports the positive effect of these programs. For example, Posner and Vandell (1994) found that after-school programs increased academic performance and assisted in remediating discipline problems for low-income students. In addition, after school programs support the connection between learning and community by creating opportunities for connecting the culture (i.e., beliefs, values, and attitudes) of the school and the culture presented in the surrounding communities (Cooper, Denner, & Lopez, 1999).

After-school programs that provide a combination of academic and counseling services have been found to increase levels of achievement and motivation for at-risk students. For example, Edmondson and White (1998)

found that middle school students, at-risk for dropping out, who received tutorial and group counseling services in tandem made the greatest significant academic gains, as measured by grade point average, in contrast to the control group who did not receive the combined services. These researchers interpreted the results as support for implementing intervention programs focused on dropout prevention in the middle grades.

Nichols and Steffy (1999) assessed the impact of an alternative learning program on elevating perceptions of students at-risk regarding their self-efficacy, and general self-esteem, as well as their levels of self-regulation, goal orientation, and school self-esteem (i.e., student self-concept concerning their school performance). The program provided academic assistance and training in social skill development and self-regulation of behavior that included stress and anger management to middle and high school students. Pre and post self-report measures were implemented upon a student's entry and exit from the program. Analyses, utilizing pre-test responses as covariates, indicated a significant gain in students' learning goals, self-regulation, general self-esteem, and school self-esteem. The effect sizes associated with the differences in student performance ranged from .52 to .60, which suggest moderate effects (Cohen, 1988).

At this time, there is limited longitudinal data on the impact of school tutorials on instruction and learning outcomes of at-risk students participating in the programs. One exception is a two-year longitudinal study conducted by Baker, Gersten, and Keating (2000). The focus of this investigation was to evaluate the effects of the Start Making a Reader Today (SMART) volunteer

tutoring program on reading achievement. Their findings indicated that the reading performance of students participating in the tutorial program was significantly higher than those of students placed in the randomly assigned comparison group. The effect sizes associated with these differences in student performance ranged from .32 to .53, which suggest moderate effects (Cohen, 1988).

In addition, Baker et al. assessed the impact of the SMART program on tutorial participants' rates of referral and placement to special education. Results indicated a relatively high special education referral rate for both the tutorial (39%) and comparison group (56%); although, there was a lower placement rate in special education for tutorial participants (26%) in contrast to the comparison group (44%). These researchers interpreted the relatively high special education placement rate for both groups to suggest that the SMART program was serving the needs of students who required academic assistance in order to achieve success in reading. However, interpretation of results pertaining to the sample's special education referral and placement rates is limited because of the relatively small sample size in both the tutorial and comparison groups.

The reviewed studies support the efficacy of after-school tutorial programs toward elevating achievement and motivation levels of students participating in the programs. More research, however, is needed to contribute to this evaluative process, as well as to identify the characteristics of the population served by these programs. Data pertaining to student characteristics and achievement level will provide opportunities to develop programs that will optimize performance of

all participants. Thus, the purpose of this study was to assess the extent to which an After-School Peer Tutoring (ASPT) program, implemented at a rural southeastern school district, was effective in elevating achievement level of at-risk middle school students. The present study explored the following questions:

1. What are the at-risk characteristics of students participating in this program?
2. To what degree does the ASPT program impact the performance of students experiencing academic difficulties?
3. What are the characteristics of students who benefit the most from the program?

Method

Participants and Procedure

The sample comprised 89 sixth- (n=20), seventh- (n=34), and eighth-grade (n=35) students enrolled in the ASPT program for one semester. Students were nominated by their teachers for the ASPT program because they were attaining failing grades (i.e., less than 70%) in various content areas. A slight majority of the participants was male (52.8%). Ethnic composition of the sample was 60.7% African-American, 34.8% Caucasian-American, 2.2% Asian-American, and 1.1% multiracial. Nearly one-fourth (22.5%) of the tutorial participants had been placed on in-school suspension during the period that they were enrolled in the ASPT program. The number of program attendees (4.5%) who had a current individualized educational plan (IEP) was low.

Tutorial program. The aim of the ASPT program is to differentiate the instructional experience of its participants by providing academic support, as well

as creating incentives for reducing the incidence of at-risk behavior often associated with poor performance. To achieve this aim, the ASPT program provides one-to-one tutorials that were conducted four nights per week (i.e., Monday through Thursday), beginning at 3:30 p.m. and ending at 4:30 p.m., in the domains of language arts, science, mathematics, and social studies. The ASPT received academic support from classroom teachers who were asked to provide assignments for the tutorial sessions, as well as to convey to the tutors their academic concerns regarding attendees' performance. Parental involvement also was a component of the program. Parents were invited to attend team meetings conducted by guidance counselors to discuss their child's academic performance. Program guidelines and dismissal procedures also were discussed at these meetings.

Tutors were college students who completed a tutorial training session. Training sessions consisted of a program that encompassed the nature and needs of the middle school student, behavior management skills, general tutorial skills, and teaching basic reading, math, and writing skills. The training program was led by a retired school teacher, alongside the assistant superintendent of schools.

The at-risk students were either assigned to the Edu-Skills laboratory (a computer-generated assessment skills program with follow-up remediation) or to homework groups. The tutors provided assistance in daily assignments, studying for a quiz/test and skills building in the areas of reading, writing, and mathematics.

A snack program was implemented under the leadership of the School Nutrition program. At 3:10 p.m. each afternoon, following dismissal of school, students were allowed to have a snack and/or take a restroom break. At all times, there was an administrator on duty. Parents of the students picked up their children at the end of each tutorial session.

On a daily basis, one tutor, representing all other tutors, met with the coordinator to provide updates on students' progress, as well as to discuss any concerns of the tutors. In addition, the tutors took ownership of the after-school program by monitoring student progress individually and meeting with other tutors to plan strategies that would assist the students' performance. Student misbehavior and/or absences were addressed daily by communicating directly with parents.

Instruments

Three sets of grades were collected to measure student achievement. The first two grades were obtained after the first and second six-week periods. The third measure was an end of semester grade. For the following analysis, tutorial participants' end -of-semester grade was used as a criterion to measure their academic performance. Also analyzed were students' suspension history and placement in special education, as indicated by the presence of an IEP, that served as indicators of at-risk behavior. Finally, to assess the characteristics of students who benefit the most from the program, analyses also focused on ethnicity and grade level using the semester average of student performance in each tutored domain as the dependent variables.

Results

The mean semester grades were as follows: mathematics (M = 70.24, SD = 13.76); language (M = 74.13, SD = 10.86); science (M = 72.54, SD = 12.08); and social studies (M = 73.70, SD = 12.07). Moreover, 60.7% of students in the mathematics tutorial program received a passing score at the end of the semester, 69.7% of students in the language arts tutorial program received a passing score, 68.5% of students in the science tutorial program received a passing score, and 64.0% of those in the social studies tutorial program received a passing score. Bearing in mind that these students were selected for the after-school tutorial program because they were attaining failing grades (i.e., less than 70%), these findings suggest that the program was successful in increasing academic achievement. Indeed, across the four tutorial programs, the mean semester average was 72.65.

A series of dependent t-tests, adjusted for Type I error, revealed that, although a notable percentage of students in the mathematics tutorial program attained passing scores, this proportion was statistically significantly lower than that for language (t = -3.62, $p < .001$) and social studies (t = -3.19, $p < .001$). Cohen's (1988) d effect sizes pertaining to these differences were .31 and .27, which suggest small-to-moderate effects. No other pairwise differences emerged in semester averages. These findings suggest that the after-school tutorial program was least successful for mathematics--a finding that is identical to that obtained the previous year of the after-school tutorial program.

A 2 (gender) x 2 (ethnicity; Caucasian-American vs. Minority) x 3 (Grade level: 6 vs. 7 vs. 8) x 2 (In-school suspension history: yes vs. no) factorial analysis of variance (ANOVA) was conducted using the semester average of each of the tutorial programs as the dependent variables, in turn. The ANOVA results are discussed below.

Mathematics After-School Tutorial Program

No statistically significant four-factor, three-factor, or two-factor interactions were found--justifying the interpretation of any main effects. Interestingly, three main effects emerged, namely: ethnicity ($F[1, 67] = 7.73$, $p < .01$; $\omega^2 = .34$), grade level ($F[1, 67] = 5.46$, $p < .01$; $\omega^2 = .40$), and suspension history ($F[1, 67] = 6.29$, $p < .01$; $\omega^2 = .31$). Follow-up analyses of the main effects revealed that Caucasian-American students ($M = 74.32$, $SD = 10.22$) had a statistically significantly higher semester average in mathematics than did minority students ($M = 68.07$, $SD = 15.07$). Consistent with this finding was the fact that a statistically significantly larger proportion (Fisher's exact $p < .05$) of Caucasian-American students (74.2%) than did minority students (54.4%) attained a passing score in mathematics at the end of the semester. The effect size, as measured by Cramer's V, was small to moderate at .19. Moreover, an analysis of the corresponding odds ratio revealed that Caucasian-American students were 2.41 times (95% confidence interval (CI) = 0.92 to 6.29) more likely than were minority students to obtain a passing score in this subject.

With respect to grade level, a linear trend was found ($F[1, 86] = 4.88$, $p < .05$), with mathematics achievement declining as grade level increased.

Specifically, sixth-grade students (M = 73.85, SD = 11.87) had statistically significantly higher achievement levels than did eighth-grade students (M = 65.57, SD = 14.57). The effect size corresponding to this difference was 0.61, which indicates a moderate-to-large effect. Seventh-grade students also had statistically significantly higher achievement levels than did eighth-grade students. The corresponding effect size of 0.53 was moderate. Further, although sixth-grade students had higher achievement levels than did seventh-grade students (M = 72.91, SD = 12.89), this difference was not statistically significant.

With regard to suspension history, students who had not experienced an in-school suspension during the semester (M = 73.26, SD = 12.41) had statistically significantly higher semester averages than did students who had been suspended (M = 60.95, SD = 13.72). Additionally, a statistically significantly larger proportion (Fisher's exact $p < .01$) of students who had not been suspended (69.1%) than did their counterparts (35.0%) attained a passing score in mathematics at the end of the semester. Cramer's V value of .29 indicates a moderate effect. Moreover, students who had not been suspended were 4.15 times (95% CI = 1.45 to 11.90) more likely than were students who had been suspended to obtain a passing score in this mathematics.

Language Arts After-School Tutorial Program

No statistically significant four-factor, three-factor, or two-factor interactions were found. However, three main effects emerged, namely: ethnicity (F[1, 67] = 6.41, $p < .01$; ω^2 =.31), grade level (F[1, 67] = 9.02, $p < .001$; ω^2 =.52), and suspension history (F[1, 67] = 7.83, $p < .01$; ω^2 =.34). Follow-up

analyses of the main effects revealed that Caucasian-American students (M = 78.10, SD = 10.32) had a statistically significantly higher semester average in language arts than did minority students (M = 71.86, SD = 10.66). Consistent with this finding was the fact that a statistically significantly larger proportion (Fisher's exact $p < .01$) of Caucasian-American students (87.1%) than did minority students (59.6%) attained a passing score in language arts at the end of the semester. Cramer's V of .28 indicates a moderate effect size. Moreover, Caucasian-American students were 4.57 times (95% CI = 1.41 to 14.71) more likely than were minority students to obtain a passing score in language arts.

With respect to grade level, a linear trend again was found (F[1, 86] = 5.98, $p < .05$), with language arts achievement declining as grade level increased. Specifically, sixth-grade students (M = 79.95, SD = 12.16) had statistically significantly higher achievement levels than did both seventh-grade (M = 72.15, SD = 9.84) and eighth-grade students (M = 72.74, SD = 10.14). The effect sizes corresponding to these differences were 0.73 and 0.66, respectively, which indicate moderate-to-large effects. No difference was found in language arts achievement level between seventh- and eighth-grade students.

With regard to suspension history, students who had not experienced an in-school suspension during the semester (M = 76.59, SD = 9.85) had a statistically significantly higher semester average in language arts than did those who had been suspended (M = 66.45, SD = 10.58). Additionally, a statistically significantly larger proportion (Fisher's exact $p < .001$) of students who had not been suspended (79.4%) than did their counterparts (40.0%) attained a passing

score in language arts at the end of the semester. Cramer's *V* value of .36 indicates a moderate effect. Moreover, students who had not been suspended were 5.78 times (95% CI = 1.98 to 16.95) more likely than were students who had been suspended to obtain a passing score in language arts.

Science After-School Tutorial Program

No statistically significant four-factor, three-factor, or two-factor interactions were found. However, three main effects emerged, namely: ethnicity ($F[1, 67] = 4.82$, $p < .05$; $\omega^2 = .27$), grade level ($F[1, 67] = 8.62$, $p < .001$; $\omega^2 = .51$), and suspension history ($F[1, 67] = 6.29$, $p < .05$; $\omega^2 = .31$). Follow-up analyses of the main effects revealed that Caucasian-American students ($M = 76.94$, $SD = 11.94$) had a statistically significantly higher semester average in science than did minority students ($M = 70.12$, $SD = 11.68$). Consistent with this finding was the fact that a statistically significantly larger proportion (Fisher's exact $p < .05$) of Caucasian-American students (83.9%) than did minority students (59.6%) attained a passing score in science at the end of the semester. Cramer's *V* of .25 indicates a moderate effect size. Moreover, Caucasian-American students were 3.52 times (95% CI = 1.18 to 10.52) more likely than were minority students to obtain a passing score in science.

With respect to grade level, a linear trend again was found ($F[1, 86] = 6.38$, $p < .05$), with science achievement declining as grade level increased. Specifically, sixth-grade students ($M = 79.35$, $SD = 9.24$) had a statistically significantly higher science achievement level than did both seventh-grade ($M = 70.00$, $SD = 13.63$) and eighth-grade students ($M = 71.11$, $SD = 10.68$). The

effect sizes corresponding to these differences were 0.77 and 0.81, respectively, which indicate large effects. No difference was found in science achievement level between seventh- and eighth-grade students.

With regard to suspension history, students who had not experienced an in-school suspension during the semester (M = 74.96, SD = 11.44) had a statistically significantly higher semester average in science than did those who had been suspended (M = 64.95, SD = 11.18). However, although a statistically significantly larger proportion of students who had not been suspended (73.5%) than did their counterparts (55.0%) attained a passing score in science, this difference was not statistically significant (Fisher's exact $p > .05$).

Social Studies After-School Tutorial Program

As before, no statistically significant four-factor, three-factor, or two-factor interactions were found. However, three main effects emerged, namely: ethnicity ($F[1, 67] = 4.19$, $p < .05$; $\omega^2 = .25$), grade level ($F[1, 67] = 6.46$, $p < .01$; $\omega^2 = .43$), and suspension history ($F[1, 67] = 4.61$, $p < .05$; $\omega^2 = .26$). Follow-up analyses of the main effects revealed that Caucasian-American students (M = 78.16, SD = 11.71) had a statistically significantly higher semester average in social studies than did minority students (M = 71.26, SD = 11.76). Consistent with this finding was the fact that a statistically significantly larger proportion (Fisher's exact $p <$ .05) of Caucasian-American students (77.4%) than did minority students (56.1%) attained a passing score in social studies at the end of the semester. Cramer's V of .21 indicates a moderate effect size. Moreover, Caucasian-American students

were 2.68 times (95% CI = 0.99 to 7.19) more likely than were minority students to obtain a passing score in social studies.

With respect to grade level, a linear trend again was found ($F[1, 86] = 5.31$, $p < .05$), with social studies achievement declining as grade level increased. Specifically, sixth-grade students ($M = 79.15$, $SD = 11.44$) had statistically significantly higher achievement levels than did both seventh-grade ($M = 72.74$, $SD = 11.74$) and eighth-grade students ($M = 71.51$, $SD = 12.12$). The effect sizes corresponding to these differences were 0.55 and 0.64, respectively, which indicate moderate-to-large effects. No difference was found in social studies achievement level between seventh- and eighth-grade students.

With regard to suspension history, students who had not experienced an in-school suspension during the semester ($M = 75.49$, $SD = 11.91$) had a statistically significantly higher semester average in social studies than did those who had been suspended ($M = 68.20$, $SD = 11.15$). Additionally, a statistically significantly larger proportion (Fisher's exact $p < .05$) of students who had not been suspended (70.6%) than did their counterparts (45.0%) attained a passing score in social studies at the end of the semester. Cramer's V value of .22 indicates a moderate effect. Moreover, students who had not been suspended were 2.93 (95% CI = 1.05 to 8.20) more likely than were students who had been suspended to obtain a passing score in social studies.

Discussion

Findings indicated that the ASPT program was effective in increasing academic performance among its attendees, because the majority of students

attained a passing score in their targeted subject areas. Indeed, between 60.7% and 69.7% of students attained a passing score in their targeted subject areas. This finding is encouraging because the students were receiving tutorial assistance for only one semester- a relatively short period of time. Further, the finding that this program is significantly more effective for language arts and social studies--domains highly dependent upon effective reading comprehension skills--is notable. Indeed, reading comprehension skills have been identified as a significant predictor of successful performance at the high school level (Demps & Onwuegbuzie, in press) and as a significant factor influencing college students' performance (Onwuegbuzie & Collins, 2001). Yet, results also indicated, that although, a notable percentage of students in the mathematics tutorial program attained passing scores (60.7%), this proportion was statistically significantly lower than that for language arts and social studies. Thus, these findings suggest that the ASPT program was least successful for mathematics. The relatively lower performance in the differential response of student participants to the mathematics tutorial program suggests that this domain may require a different instructional approach in order for students to achieve better learning of the subject matter. In any case, future research should investigate further the effect of the tutorial program on mathematics achievement.

Although, the positive gain in student performance across the targeted subject areas is encouraging, the results should be interpreted with caution. The positive gain in student performance may be attributed to statistical regression because the participants were selected for the tutorial program on the basis of

their failing scores (Onwuegbuzie, in press). Specifically, a floor effect may have prevailed. However, the majority of the students was not receiving special education services and, therefore, were not displaying an extremely low performance that characterized the performance of students receiving these services. Additionally, the small number of participants (4.5%) in the tutorial program with current IEP's indicates that the tutorial program provides services to students who are experiencing academic difficulties that require intervention, but not necessarily the intensive on-going assistance provided by special education specialists.

Also examined was the impact of at-risk characteristics, namely, students' suspension history and placement in special education, on their academic response to the tutorial program. Results indicated that students' suspension was a deterrent toward elevating their achievement across the tutored subject areas. This result suggests that providing training in social skills and behavior management techniques may enhance students' benefits from the academic tutorial assistance. The inclusion of this training, as a component of the program, is supported by the extant literature. For example, Edmondson and White (1998) found that middle school students, at-risk for dropping out, who received tutorial and group counseling services in tandem made the greatest significant academic gains in contrast to the control group who did not receive the combined services. Also, Nichols and Steffy (1999) found that, middle and high school students' self-perception regarding learning goals, self-regulation, general self-esteem, and school self-esteem improved after participating in a program that combined

instruction in academic areas with counseling designed to elevate social skill development and self-regulation of behavior that included stress and anger management.

The present study also examined ethnicity and grade as potential variables mediating student achievement in the tutored content areas. A consistent finding across the tutored areas was that Caucasian-Americans benefited more from the tutorial services, as indicated by a statistically significantly higher semester average across the four content areas and a statistically significantly higher passing rate in mathematics, language arts, science, and social studies. This is an important finding because, nationally, students representing minority groups have a higher dropout rate (Dyroos, 1990). This finding underscores the importance of assessing the characteristics of the population served by these programs and disaggregating the data in order to optimize the performance of all participants.

A consistent finding across the tutored domains is that the sixth-grade students followed by the seventh-grade students benefited more from the tutorial services than did the eighth graders. It is possible that the relatively short duration of the students' enrollment in the tutorial program may have negatively impacted the performance of these eighth-grade students, who attained the lowest level of achievement across the tutored subject areas. To the extent that this is true, eighth graders may require a longer tutorial intervention. However, the positive impact of the tutorial program for students in the sixth grade support the conclusions of Edmondson and White (1998), who advocated the importance

of early intervention programs toward elevating student performance and consequently lessening the risk of students' dropping out of school. Unfortunately, it is beyond the scope of the present study to assess the longitudinal effect of the tutorial program on the academic performance as well as the rates of referral and placement in special education of the participants. This should be the focus of future research.

These findings contribute to the small corpus of empirical research examining the impact of after-school tutorials on student academic performance and the degree to which at-risk indicators, as evidenced by students' suspension history and placement in special education mediate the efficacy of these programs. Interpretation of these results is limited by the lack of a control group to minimize internal threats to validity and the use of a non-random sample from a geographically restricted area. Therefore, replication of this study is needed utilizing a larger sample size, observed longitudinally, and the inclusion of measures designed to assess affective variables, (e.g., motivation and self-esteem) that will provide a broader analysis of the process of learning for at-risk middle school students.

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